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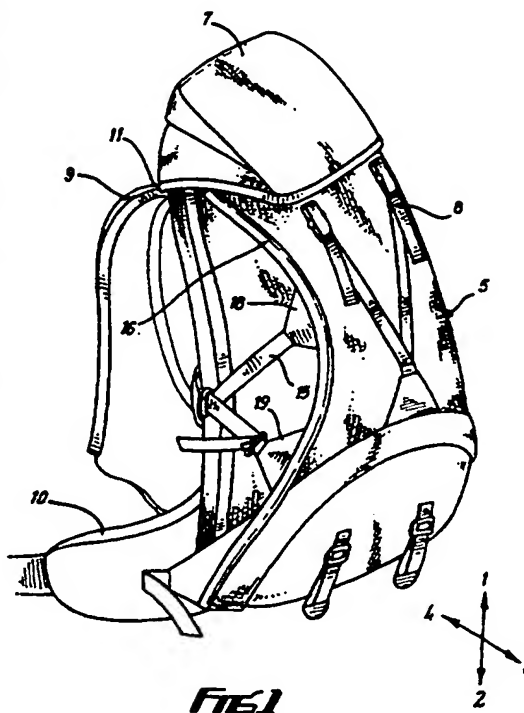
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GB 2328147 A

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ONLINE: WPI, EPODOC, PAJ

(54) Abstract Title  
Bag

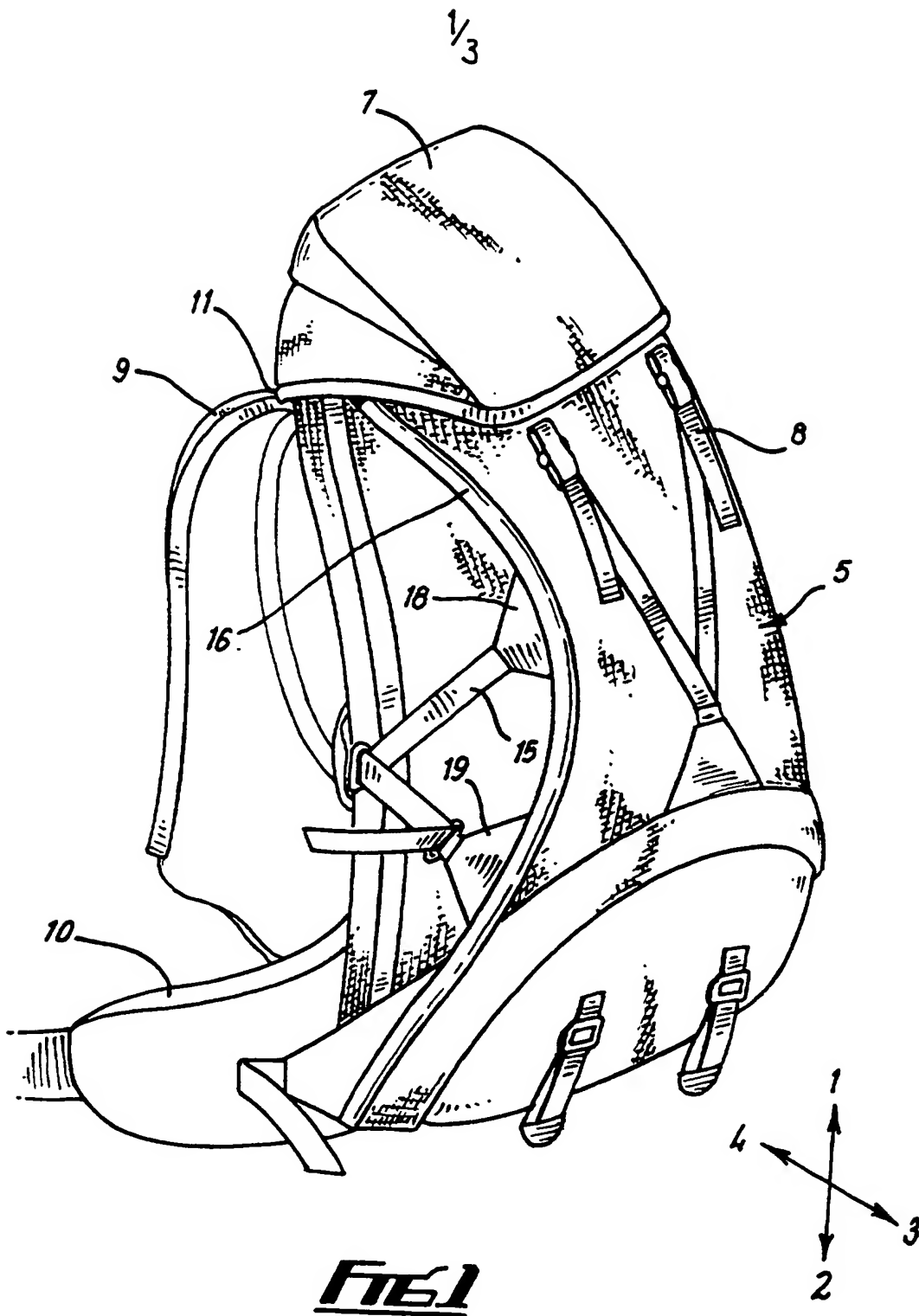
(57) A bag 5 adapted for wearing on the body comprises a fabric body and means for supporting the fabric body on a wearer, the fabric body having a first face, in use, intended to be directed towards the wearer and a second face intended, in use, to be directed away from the wearer, the means for supporting being connected to upper 11 and lower 12 mounting points on the fabric body, and further comprising a support member running in the direction from the upper mounting point 11 to the lower mounting point 12 in association with the second face of the fabric body and arranged to hold the second face away from the wearer. The bag 5 is preferably a rucksack and the means for supporting comprises shoulder straps 9 connected to the fabric body at the points 11, 12 and a hip belt 10 connected to the same lower mounting point 12 as the shoulder straps 9. The support member of the bag 5 runs from the upper shoulder strap mountings 11 to the lower strap mountings 12 in association with the second face of the bag 5. The support member may be connected directly or indirectly to the shoulder straps 9 and/or the hip belt 10. The support member is preferably arcuate and is disposed in a sleeve 16 on the outside of the bag 5 which curves away from the wearers body, in use. The support member is operative to hold the first face of the bag 5 away from the second face and is arranged to tension the first face of the bag 5 by urging the upper 11 and lower 12 mountings apart. The support member is preferably a resilient carbon fibre rod, which is straight with no load applied to it and is constrained to adopt a curved or arcuate form when used with the bag 5. The bag 5 preferably comprises two rods 13, 14 which are disposed either in a generally parallel fashion between, or cross over between, the upper 11 and lower 12 mountings. The bag 5 preferably features one or more straps 15 running between the first and second faces of the bag 5, operative to draw the two faces together.



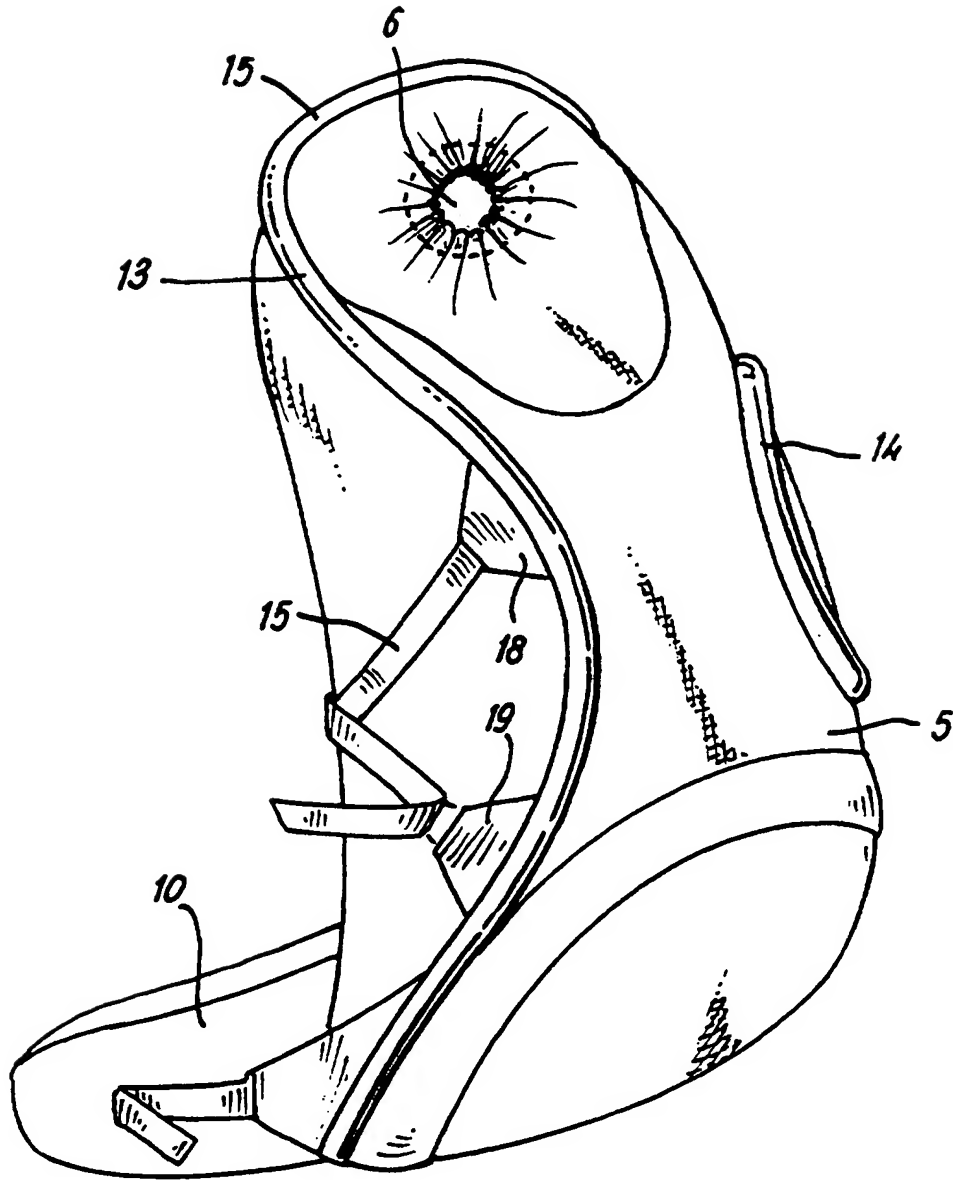
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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

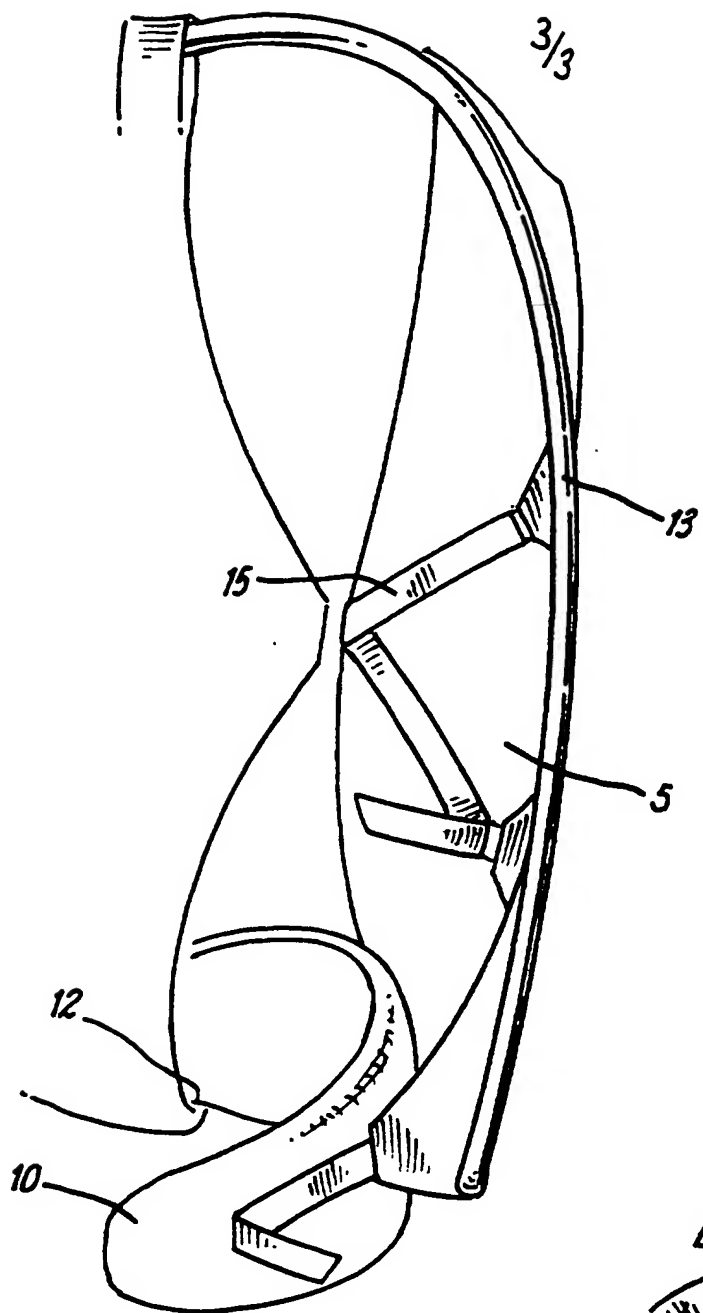
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.



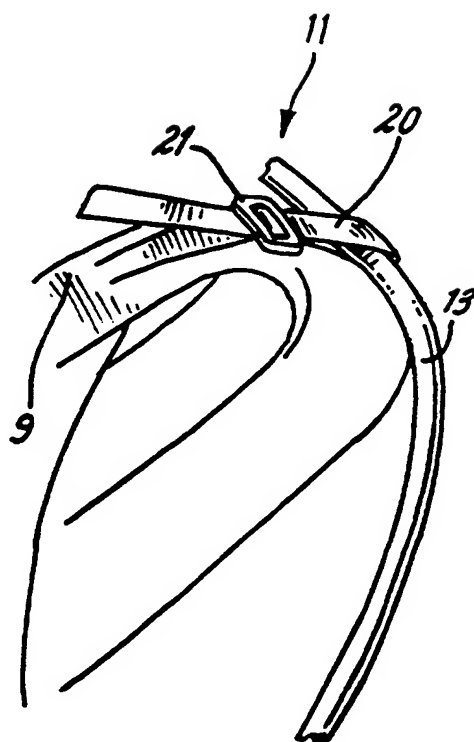
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**FIG 2**



**Fig. 3**



**Fig. 4**

BAG

The present invention relates to a bag and particularly, although not exclusively, to a rucksack.

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Rucksacks are well known and traditionally comprise a bag with two straps arranged to enable the bag to be slung from both shoulders of a wearer. The opposite ends of each strap are generally attached to upper and lower mountings on the bag.

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A problem with rucksacks is that they can put considerable strain on the wearer's back and shoulders, especially where heavy loads are carried. Another problem is that because the rucksack lies against the wearer's back it prevents the circulation of air around the wearer which can lead to discomfort through overheating and trapped moisture. Many attempts have been made to address these problems.

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One approach has been the provision of an internal or external frame arranged to lie generally between the bag and the wearer. The bag is attached to the frame as are shoulder straps and a hip belt. The frame and hip belt are provided in an attempt to direct the weight of a load carried in the rucksack through the wearer's hips rather than shoulders. However, the frame can make the rucksack uncomfortable to wear and considerably increase its weight.

20

Rucksacks incorporating frames often also include so-called compression straps. These straps are arranged to compress a load carried in the bag towards the frame. This prevents sagging of the load and attempts to move the centre of mass of the load closer to the wearer. Again, this is to try and direct a greater proportion of the weight of the load through the wearer's hips.

In one known arrangement compression straps act on an arcuate carbon fibre rod. The ends of the rod are mounted at opposite sides respectively of the bottom of the rucksack, near to the hip belt. The rod extends outwards of the wearer from its mountings, to encircle the bag. Compression straps are arranged to draw the rod towards the bag, by pivoting the rod about its mounting points to move the rod upwards and towards the wearer in an arc, to compress the load. Again, however, a frame is required against which the load may be compressed.

Attempts to address the problem of a rucksack preventing air from circulating around a wearer's back includes the provision of porous mesh panels disposed to lie between the wearer's back and rucksack in use, possibly including aluminium staves.

The present invention has been made in consideration of the abovementioned, and other, problems.

According to the present invention there is provided a bag adapted for wearing on the body comprising a fabric body and means for supporting the fabric body on a wearer, said fabric body having a first face intended, in use, to be directed towards the wearer and a second face intended, in use, to be directed away from the wearer, said means for supporting being connected to upper and lower mounting points on the fabric body, and further comprising a support member running in the direction from the upper mounting point to the lower mounting point in association with the second face of the fabric body and arranged to hold said second face away from the wearer.

Preferably, the bag is a rucksack and the means for supporting comprise shoulder straps connected to the fabric body at the upper and lower mounting points. More preferably, the means for supporting additionally comprise a hip belt connected to a lower mounting point. The shoulder straps and hip belt may be connected to a common lower mounting point.

Where the bag is a rucksack then the first face is what is generally referred to, and hereinafter defined, as the back of the rucksack. The second face is, correspondingly, the front of the rucksack.

In the case of such a rucksack, therefore, the support member preferably runs from the upper shoulder strap mountings to the lower hip belt and/or shoulder strap mountings, in association with the front of the rucksack. The

support member may be connected directly or indirectly to the shoulder straps and/or hip belt.

5       The support member may be disposed on either the inside or outside the bag. It is preferably disposed in a sleeve formed on the outside of the bag, although any other suitable fastening means could be employed.

10       The support member is preferably curved, more preferably arcuate and disposed to curve away from the wearer's body, in use. That is, to present a concave side to the wearer's body. The support member is preferably also operative to hold the first face of the bag away from the second face. In the case of a rucksack, the support member is preferably operative to hold the front of the rucksack away from the back of the rucksack.

15       The support member is preferably resilient. It is also preferably operative, in use, to urge the second face of the bag (the front in the case of a rucksack) both away from the wearer and the first face, or (the back in the case of a rucksack) of a bag.

20       The support member is also preferably arranged to tension the first face of the bag, or back of a rucksack by urging the upper and lower mountings apart.

The support member preferably comprises a resilient rod, for example a carbon fibre rod. The rod is preferably straight, at rest, when no load is applied and is constrained to adopt a curved or arcuate form when used with the bag. As such, the rod will try to adopt a straight configuration when in use. This will provide the desired effect by tensioning the first face of the bag and urging the first and second faces apart.

Most preferably, particularly in the case of rucksacks, two resilient rods are provided. These could be disposed in generally parallel fashion between the upper and lower mountings or they could cross over. More rods could be employed.

A bag or rucksack according to the invention may also include one or more straps running between the first and second faces of the bag (front and back of a rucksack) being operative to draw the two faces together.

Bags and rucksacks according to the invention confer many advantages over known rucksacks. The support member acts to give the bag structure and since it runs between the two mounting points acts to direct a considerable portion of the load through the lower mounting point and hence the wearer's hips rather than shoulders. Placing the support member on the side of the bag directed away from the wearer contains the load between the support member and the wearer's body, preventing sagging of the load, and keeping the centre

of mass of the load close to the wearer's hips. The rods, however, unlike conventional frames do not rest against the wearer, so that the bag or rucksack is more comfortable to wear. Where the support member takes the form of a resilient rod, or similar, arranged to urge the upper and lower mountings apart  
5 this tensioning of the first face of the bag creates an air space between the bag and the wearer. The overall tensioning of the bag overcomes the need for conventional internal or external framework.

In order that the invention may be more clearly understood an  
10 embodiment thereof will now be described, by way of example, with reference to the accompanying drawings in which:-

Fig.1 shows a front perspective view of a rucksack according to the invention;

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Fig.2 shows a simplified front perspective view of the rucksack of Fig.1 with some features removed and the location of the semi-rigid rods highlighted;

Fig.3 shows a simplified side rear perspective view of the rucksack of  
20 Fig.1 with some features removed and the location of the semi-rigid rods highlighted; and

Fig.4 shows a partial perspective view of the rucksack of Fig.1 showing

how the shoulder straps are secured to the semi-rigid rods.

For the avoidance of doubt, as used herein, the terms "upper, lower, front and rear" are intended to refer to the general directions indicated  
5 respectively by the arrows labelled 1,2,3 and 4 shown in Fig.1.

The same reference numerals are used in each figure to identify corresponding parts of the rucksack.

10 Referring to the figures, the rucksack comprises a fabric bag, generally 5, having an opening 6 shown partially closed (in Fig.2) with a drawstring. In use, the opening 6 is concealed by a cover 7 which may be secured over the opening by way of straps 8.

15 The bag is fitted with shoulder straps 9 and a hip belt 10 to enable it to be slung from the shoulders and secured to the waist of a wearer so that the back of the rucksack is directed towards the wearer's back and the front of the rucksack away from the wearer's back.

20 The shoulder straps are connected to upper 11 and lower 12 mounting points. The hip belt 10 is also connected to the lower mounting point 12.

The bag includes two semi-rigid carbon fibre rods 13 and 14. The rods

are joined together near the top of the bag at 15. The rods run in nylon tubes  
sewn into sleeves 16 sewn onto the outside of the front face of the bag 5.  
The sleeves extend from a point at the top of the bag 15 at the upper mounting  
11 in association with the front face of the bag along opposite sides  
5 respectively of the bag to a point near the lower mounting 12. In an alternative  
embodiment, a single length of rod could be employed. The rods could also be  
joined at the bottom of the bag.

The carbon fibre rods 13,14 are resilient in nature and, before insertion  
10 into the sleeve 16, are straight. However, the body of the bag 5 and sleeves  
11 are arranged so that when the rods 13,14 are inserted into the sleeves 16  
they are constrained to adopt a curved form. Although the sleeves 16 are  
sufficiently long to accommodate the rods they are disposed on the bag so that  
the length of fabric along the back of the bag, between opposite ends of the  
15 sleeves, is less than the length of the rods. When inserted, the rods 13,14 try  
to adopt a straight configuration and act to tension the bag. In particular, they  
urge the upper 11 and lower 12 mountings apart and the front face of the bag  
away from the rear.

20 The behaviour of each rod is somewhat similar to that of a bow,  
tensioning the fabric along the back of the bag. One effect of this is to hold  
the rucksack open which makes it easier to fill. Another is that since the back  
of the rucksack is held taut and, to some extent, away from the wearer's back,

this enables air to circulate between the rucksack and wearer's back.

Compression straps 15 are also provided between the front and rear of the rucksack (only one strap is visible in the drawings). The straps run  
5 between two loops 18 and 19, attached to the sleeve 16, and the back of the rucksack. The straps may be used to draw the front and back of the rucksack together. This will tend to straighten the rods 13,14 which, since they are constrained by the sleeve 16, will tend to further tension the bag. The compression straps may conveniently be used to alter the characteristics of the  
10 rucksack, depending upon the size and type of load to be carried.

The provision of flexible rods 13,14 removes the need for a conventional rigid frame along with the various straps and buckles usually needed to constrain a load. This typically leads to a weight saving of up to 10% as well  
15 as making the rucksack more comfortable to wear. As the rods also, to some extent, tension the front of the bag, they prevent sagging of a load carried therein.

Fig.4 shows one way in which the shoulder straps 9 may be mounted on  
20 the bag. The straps 9 are connected by way of an additional strap 20 and buckle 21 passed around the semi-rigid rod 13, forming the upper mounting point 11.

The above embodiment is described by way of example only, many variations are possible without departing from the invention.

CLAIMS

1. A bag adapted for wearing on the body comprising a fabric body and means for supporting the fabric body on a wearer, said fabric body having a first face intended, in use, to be directed towards the wearer and a second face intended, in use, to be directed away from the wearer, said means for supporting being connected to upper and lower mounting points on the fabric body, and further comprising a support member running in the direction from the upper mounting point to the lower mounting point in association with the second face of the fabric body and arranged to hold said second face away from the wearer.
2. A bag as claimed in claim 1 wherein the bag is a rucksack and the means for supporting comprise shoulder straps connected to the fabric body at the upper and lower mounting points.
3. A bag as claimed in either claim 1 or 2 wherein the means for supporting comprise a hip belt connected to a lower mounting point.
4. A bag as claimed in claim 3 when appendant to claim 2 wherein the shoulder straps and hip belt are connected to a common lower mounting point.
5. A bag as claimed in any of claims 2 to 4 wherein the support member runs from the upper shoulder strap mountings to the lower hip belt and/or shoulder strap mountings, in association with the second face of the bag.

6. A bag as claimed in claim 5 wherein the support member is connected directly or indirectly to the shoulder straps and/or hip belt.
7. A bag as claimed in any preceding claim wherein the support member is disposed in a sleeve formed on the outside of the bag.
8. A bag as claimed in any preceding claim wherein the support member is arcuate and disposed to curve away from the wearer's body, in use.
9. A bag as claimed in any preceding claim wherein the support member is operative to hold the first face of the bag away from the second face.
10. A bag as claimed in any preceding claim wherein the support member is arranged to tension the first face of the bag by urging the upper and lower mountings apart.
11. A bag as claimed in any preceding claim wherein the support member is resilient.
12. A bag as claimed in any preceding claim wherein the support member is formed from carbon fibre.
13. A bag as claimed in any preceding claim wherein the support member comprises a rod.
14. A bag as claimed in claim 13 wherein the rod is straight, at rest, when no load is applied and is constrained to adopt a curved or arcuate form when used with the bag.
15. A bag as claimed in either claim 13 or 14 comprising two rods.

16. A bag as claimed in claim 15 wherein the two rods are disposed in a generally parallel fashion between the upper and lower mountings.
17. A bag as claimed in claim 15 wherein the two rods are disposed to cross over between the upper and lower mountings.
18. A bag as claimed in any preceding claim comprising one or more straps running between the first and second faces of the bag being operative to draw the two faces together.
19. A rucksack substantially as herein described with reference to the accompanying drawings.



Application No: GB 9824934.5  
Claims searched: All

Examiner: Damien J Huxley  
Date of search: 14 February 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): A4G

Int Cl (Ed.7): A45F 3/04, 3/08

Other: ONLINE: WPI, EPODOC, JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 328 147 A (BERGHAUS) see the figures especially	1 to 6, 8, 9 & 11

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.